The CHEMIST

NOVEMBER, 1935 VOLUME XII, NO. 8

AMERICAN INSTITUTE OF CHEMISTS

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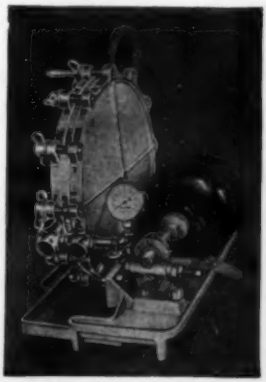

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EDITORIAL

EDITORIALS BY COUNCILORS—II

The Responsibility of the Chemist

By Howard S. Neiman, F.A.I.C.

The Secretary of the Institute forcefully calls attention to the importance of professional co-operation.

THE BOY who stood upon the burning deck whence all but he had fled possessed the same erroneous and destructive idea, that there is something heroic in personal isolation that is an attribute of the average American chemist. Those old hermits who separated themselves from the human race and led their lives of selfish meditation far removed from their fellow-man never added an inch to the growing stature of civilization.

The average chemist, like the useless hermit, avoids the helpful touch of others of his race and lives in the stifling atmosphere of his own confinement.

Robinson Crusoe was as useless to the world as was his parrot and his good man Friday, until he returned to the inhabited world and told others of what he had seen and of what he had done.

Too many chemists are leading an Ethiopean life of the far distant past rather than a modern life of intimate cooperation with other civilized beings. They are truly in the horse and buggy age.

From the first page of the history of the human race to today, man has appreciated the necessity of and has adopted the idea of cooperation through the various stages of the family, the tribe, the state, and the nation, all except the chemist, who has always held himself aloof from his fellow chemists.

The idea of assisting other chemists in order that he may be assisted never occurs to his limited intelligence which is bounded by test tubes, crucibles, and acid-eaten aprons.

The chemist is a unique branch of the homo genus, standing apart from all other members of the human race, in that he has never appreciated that the only opportunity by which he can raise his profession to a standard of public acknowledgement is through the door of cooperation with his fellow chemists; and the result is deplorable.

The public recognizes the profession of the lawyer and the doctor, and even the barbers, the plumbers, and the chiropodists have placed their activities upon a plane of public respect through a cooperation based upon training and experience and the practice of professional ethics.

Every chemist should understand that he, alone, is but a minute atom in the chemical compound called life and that he must join with many other atoms if he would be a part of the human reactions which lead to success and happiness.

Every chemist should be saturated with a deeply embedded affection and interest for his profession, not simply for its financial and intrinsic returns to him but for the profession as a science, and for the benefits it has conferred and will confer upon the human race.

There is no nobler and no more useful science than chemistry. It is the foundation element of life and happiness, and the chemist should be proud to be a part of this all-moving force of humanity.

The word "chemist" often means nothing to those desiring an expert opinion or a correct analysis, as it is far too frequently employed by those totally lacking in chemical education and experience, and these pseudo-chemists prey upon both the public and the trained chemist to the injury of both.

The proper professional standing of chemists and the proper appreciation of the science of chemistry can be accomplished only by a coordinated endeavor upon the part of the chemists themselves to raise the standards of their profession to the height which it so justly deserves.

Every chemist should take a dynamic and not a lethargic interest in his profession; should bend every energy to raise the standards of ethics of those who are responsible for it; should join with every other chemist

(*Please turn to page 348*)

Fifteenth Chemical Exposition Idea Market Place

By Leon V. Quigley, F.A.I.C.

THE Fifteenth Exposition of Chemical Industries will be held during the week of December second at Grand Central Palace, New York. Its number, "Fifteenth," reminds us to consider those early Chemical Expositions which formed the foundation of a show which this year looks like a "sold out hit" with regard to space leasing.

In 1914, about the beginning of the World War, in order to increase the usefulness of the Chemists' Club Library in New York, Dr. William M. Grosvenor, F.A.I.C., gathered around him several members who agreed to spend one evening a week as librarians. Charles F. Roth, then chief chemist of the Standard Oil Company of New York, was one of these volunteer librarians. He was impressed by the number of requests for definite information as to where this type of equipment or that particular new chemical material might be bought. The need for a definite clearing house of information became even more evident when

the Allies, hard pressed, turned to us for chemicals for war purposes. The value of a person's knowledge may be measured by his ability to relate facts. In this case the facts in the storehouse of a man's knowledge were combined, and the resulting answer to the need for a clearing house was an exposition. It was to be a place where the producer of chemicals could show his products and the equipment manufacturer could acquaint the chemical and allied industries with the latest developments in large scale production methods. Mr. Roth sounded out prominent chemists and executives on the wisdom and feasibility of his idea. There was encouragement from all and worth-while suggestions from many. The problem of selecting a sponsor, however, met with the "doubting Thomas" attitude which is so usual toward a novel suggestion. The International Exposition Company soon recognized the possibilities of the idea, and then Charles F. Roth and his confrères saw their plans materialize.

AN ADVISORY Committee was formed. Its members were Charles H. Herty, F.A.I.C., *Chairman*, Raymond F. Bacon, Arthur D. Little, R. P. Perry, T. B. Wagner, and Henry B. Faber. Their cooperation and the services of Bernard C. Hesse, L. H. Baekeland, and M. C. Whitaker, F.A.I.C., proved invaluable. On September 20, 1915, the doors of the Grand Cental Palace opened for the First Exposition of Chemical Industries. There were 83 exhibitors, and the show was pronounced a definite success by the press, the general public, and the industry. It revealed graphically to the public the gaps in American chemical industry. Subsequently wealth greased the machine of progress, and science and engineering created the new needed industries.

At the Second Exposition, held in the fall of the following year, the number of exhibitors increased to 188. From that time on every Exposition has proved more popular than the preceding one, and the series of Chemical Expositions, extending over a period of twenty years has been a great incentive in advancing the manufacture of American chemicals and the necessary appliances for producing them. American chemical industries have made more progress in the last twenty years than in all the years previous to the time of the first Chemical Exposition.

By its very nature, an exposition is a meeting place and market for thousands of people who through its agency converge for a common purpose. It is axiomatic that they advance their individual progress through the strength engendered by unified effort. The story of an exposition is told in terms of the strongest senses, namely, through appeal to the eye and ear. The Chemical Exposition, presenting a pageant of

the chemical industry in terms of materials, products, and machines has become a vital, compelling force in the chemical life of the nation. Many of the most noteworthy advances have been conceived and nurtured to maturity under its auspices. Thousands of administrative officials and executives in charge of purchase attend to estimate the areas of competition and to compare the new offerings of the producers of machines and materials as a basis for contract purchase specifications. Development, research, operating, and engineering personnel are sent by their companies to study, just as at a course of visual instruction, the relative advances of their own and competitive lines. Here visitors actually see the chemicals, study the machines in operation, and in some cases, witness the production and packaging of the finished product. The product claims advanced in advertising, in trade journal and newspaper articles are here corroborated by oral advice and three dimensional animated display.

THE planning underlying the design and construction of the Fifteenth Exposition of Chemical Industries has been going on for more than a year in advance. Exhibiting companies had first to decide by process of market analysis and competive trends what they would feature. They did this from the standpoint of sales economy and product progress. Their next step was to contact with specialists in exhibit construction, unless they had such a department of their own, to insure that their presentation be given a poignant setting and sequence. The technique of display presentation, coupled with the furnishing of the exhibit space and suitable captioning, meant the completion of only part of the problem. Chief factors still to be dealt with by each exhibitor were the selection of personnel, adapted to the important task of knowing everything essential about the product and meeting the purchasing public in a gracious manner. Then there was the matter of company literature, designed to inform and interest each important classification of the Exposition's attendance.

The exhibits of the Exposition of Chemical Industries cover the broad fields of raw materials, machinery, and finished products. Further classifications are designed to meet the specific interests of large groups of producers and purchasers. Among these are chemicals and chemical products, metals and alloys, laboratory equipment and supplies, instruments of precision, containers and packaging, materials handling equipment; brewing, distilling, and bottling equipment; industrial chemical equipment and machinery. A number of exhibits will feature the modern synthetic plastics and moulded products, also lacquers, varnishes,

and corrosion resisting surface coatings of wide variety. Exhibits designed to explain natural resources and a variety of educational exhibits will complete the great pageant.

The event this year promises to be a great exposition of equipment in terms of heavy plant machinery and the innumerable accessory machine units. These serve the great industrial plants and represent the handling of mass production operations after they have been worked out in the laboratory and semi-work's production scale. Quite naturally this trend will be responsive to the fact that the American market, after years of depression, has a stored up demand for capital goods and for plant equipment generally. Many new machines will be needed to replace units which the mere factor of obsolescence should have replaced sooner. New chemical plants established during 1934 are good omens of universal interest in plant modernization, and a sign that the Chemical Exposition will meet a current need. Statisticians point out that there is more than $100,000,000 set aside for new plant projects in the chemical industries. As a background for advanced building and machine maintenance, the chemical processes themselves must certainly have been advanced by the unprecedented backlog of research facts which have become available during the dull years.

LET us review the present conditions in outline. World-wide demand for equipment for the manufacture of chemicals and allied products is present and immediate. America holds the leading position in chemical industries. International interest is naturally directed toward the leader. The problem then is to put in harmonious and reciprocal relationship—the supply and the demand, to create a common meeting ground for producer and consumer. The Fifteenth Exposition of Chemical Industries will take place when the demand is immediate, and in the United States where the interest is centered. At the Grand Central Palace during the week of December 2nd to 7th, the factors of supply and demand will be efficiently coordinated.

The Exposition of Chemical Industries has indeed become a clearing house of information, a measuring stick of chemical progress, a unique world market place. Once more the chemical world awaits the biennial event which brings to a climax the progress of the American chemical industry in terms of invention, research, development, engineering, and sales.

Attend the 15th Exposition of Chemical Industries. See page 336.

Some Trends in the Petroleum Industry

By Benjamin T. Brooks, F.A.I.C.

In a talk before the New York Chapter of the Institute, Dr. Brooks discussed ways of postponing an inevitable petroleum shortage. Higher prices are imminent for petroleum products.

THE development of cracking processes for gasoline, beginning in 1912, was prompted by the fact that the demand for motor fuel had exceeded the amount available in the crude petroleum, and by the fear that the rapidly increasing demand would become greater than the available supply from the crude oil. The technical improvements resulting from this stimulus, and the improved economic condition of the industry which ensued, would be difficult to over-estimate. One company capitalized its cracking patents on its books as worth $100,000,000. It is certain that a shortage in our domestic production of crude petroleum will prove to be a stimulus to other chemical and engineering developments, as was the threatened shortage in 1912. The scientific preparation and ground work have at least partly been laid down and the industry is far better equipped in scientifically trained personnel to cope with such changes than it was in 1912.

It is by no means premature to consider the possibility of a petroleum shortage in the United States; to consider what has already been done by chemical engineers and researchers to produce petroleum-like products from other sources; and to consider what changes are likely to occur in the petroleum industry and in the utilization of petroleum products. There never has been any question but that some time our petroleum supply would approach exhaustion. But long before the extreme condition of exhaustion is reached, we shall experience a shortage of petroleum. The question is when a shortage will be reached. We believe that there are now sufficient facts to give a reasonable answer to that question. We may expect a shortage of petroleum sufficient to necessitate a marked increase in our imports and an increase in the petroleum price structure within five to eight years. Dependence upon imports for a substantial part of our petroleum requirement would, in

the event of war, make the nation dependent upon the navy to protect these imports.

Five to eight years is indeed a short time in which to develop to efficient large scale operation any new process of major importance. The ammonia-soda process was first patented in 1838 but was not commercially successful until 1872. The successful development of viscose took nearly as long a time. Bergius began his work on the high pressure hydrogenation of coal in 1913, and Franz Fischer started his work on hydrogenation in 1914. It is fortunate that work on these processes was started at such an early date and has been brought to a stage which assures their being important factors in alleviating a future petroleum shortage.

It required forty-four years of the American Petroleum Industry, from 1857 to 1900, to produce the first one billion barrels of petroleum from American fields. We now consume this amount in thirteen or fourteen months. The navies of the world now operate almost entirely on fuel oil.

TEN years ago, President Coolidge appointed the Federal Oil Conservation Board. The fear for our future oil supplies which actuated the appointment of this Board has largely been dissipated during the intervening ten years by the discovery of a series of new producing fields of record-breaking magnitude. It is also a fact that every estimate of our total possible future production of crude petroleum, in the United States, made by qualified authorities up to 1925, has been exceeded by actual production, in addition to which we have a known future reserve of ten to twelve billion barrels. These earlier estimates were made prior to the development of deep drilling and could not include oil existing beyond the reach of the drilling methods of those years. Today, with wells down to 12,000 feet, drilling in all but a few localities has been carried to the lowest possible producing strata and in many cases to the bottom of the sedimentary rocks.

The statement of our reserves in terms of ten or twelve years is misleading as indicating that no concern need be felt until the end of that period, whereas we shall need a new supply of considerable magnitude in about five years. Though we may experience a shortage in five to eight years, we shall certainly not see exhaustion of our oil fields in fifty years. For example, oil wells in New York State which attained peak production in 1882 are still yielding about 0.3 per cent of our domestic production. Though our known reserve may be equivalent to twelve years' consumption, there is no method now known by which this

oil can be brought above ground in twelve years, no matter what its value.

Following a period of increasing petroleum imports and increasingly high price levels for crude and all petroleum products, a point will be reached when certain substitutes will begin to compete and check the rising price of petroleum. The most promising of such substitutes are shale oil, oil made by high pressure hydrogenation of coal, and oil made by the reduction of water gas. Each of these processes can produce motor fuel and lubricants in quantities sufficient to meet our present petroleum requirement for many years, but only at substantially higher price levels.

THE question of an adequate supply of petroleum is almost entirely one of an adequate motor fuel supply. Gasoline, including that made by cracking, represents about 55% of our crude. Throughout the history of the petroleum industry the relative amounts of oil going into different products or different uses have continually shifted and will continue to do so. The trend of recent years, characterized by increased gasoline manufacture and relatively decreased output of fuel oil and gas oil, may be expected to continue. Fuel oil has been a great dumping ground and in this field oil has competed with coal with the price governed primarily by the price of coal. Increased petroleum consumption of oil products of higher value, such as motor fuel and lubricants, or the development of a shortage of crude, or more probably both of these causes operating together, will tend to eliminate the lower priced petroleum products. Research and engineering of the last decade have provided methods which give to the industry the flexibility necessary to cope with this situation. For example, it is not necessary to produce residual fuel oil incidental to cracking, since by hydrogenation such fuel oil is eliminated with greatly increased gasoline yields.

There is nothing really alarming in the prospect of an anticipated shortage of petroleum. While the market for some of the lower priced petroleum products will be given up for those commanding higher prices, we shall continue to have motor fuel and lubricants available in quantity but certainly we shall have to pay more for them.

One of the conspicuous changes in the petroleum industry is the increasing support of scientific research of all kinds. This has been marked by a liberal attitude toward the publication of scientific research. The influence of the researches established in universities, through funds administered by the American Petroleum Institute, has been widespread and the centers of interest thus created are still doing work of the great-

est importance even though the original funds were expended several years ago. Universities which are doing outstanding work in petroleum research and engineering are: Pennsylvania State College, Massachusetts Institute of Technology, The University of California, University of Oklahoma, University of Pittsburgh. Very valuable work is also being done by the U. S. Bureau of Standards and the U. S. Bureau of Mines.

OTHER trends worth noting are the increased use of petroleum as a raw material for such well known industrial commodities as ethyl alcohol, acetone, butyl and amyl alcohol, and methyl ethyl ketone used as lacquer solvents, acetic acid, glycols used in dynamite and as anti-freeze for radiators, etc. Another conspicuous trend is the production of motor fuel of higher anti-knock rating than was thought possible two years ago. For especial uses such as aviation fuel, the production of special gasoline having an anti-knock rating of 100 octane appears to be entirely feasible. Tests made by the Army Air Corps during the past year show that such a motor fuel develops somewhat more than 20% greater power than standard aviation gasoline. This means that planes so equipped can fly higher and faster.

Institute at Exposition

THE AMERICAN INSTITUTE OF CHEMISTS will have exhibit space number 2-E on the mezzanine floor, next to the main stairway, of Grand Central Palace, New York, N. Y., at the 15th Exposition of Chemical Industries to be held December second to seventh.

Institute members will be at the booth to meet visiting members or to answer questions about the Institute.

THE CHEMIST will be represented at the booth by this issue, and subscriptions will be available to those interested in the profession of chemistry or to members who wish THE CHEMIST sent to friends or students.

Members and friends of The AMERICAN INSTITUTE OF CHEMISTS are cordially invited to visit the Institute's booth, to register in the guest-book, and to meet the members who are on the reception committee.

The Institute will be glad to furnish its members and friends with a limited number of tickets for the Exposition. These may be secured by sending a stamped, self-addressed envelope to the Institute's office at 233 Broadway, New York, N. Y.

Some Sewage Disposal Methods

By W. D. Turner, F.A.I.C.

A professor of chemical engineering at Columbia University discusses practical solutions of sewage disposal problems.

IN EARLY days when man was a wanderer on the face of the earth, the matters of water supply and sewage disposal meant nothing to him. But as his social instincts caused him to build groups of permanent homes, he had to begin locating these with due regard for a source of water. As long as a plentiful supply of good water was available he thought little about the problem of sewage disposal.

But when the community became so large that its own sewage began to pollute its water supply, then came the attention to sewers and sewage. This attention was not a matter of foresight on the part of the intellectual leaders. Rather it was forced on the public consciousness by terrible epidemics and foul scourges.

Ultimately the survival of community organizations, and particularly the ability of one city to gain supremacy over another, were recognized to depend in no small measure on the attention which was given by the great public leaders of that city to the matters of water supply and sewage disposal. This is exemplified in the old Roman civilization where recorded history demonstrates that great aqueducts and sewers were among the Romans' most noted engineering achievements.

As the Dark Ages came upon the world, all this progress was lost, and it is only in comparatively modern times that men have again become alert to the situation. Recently, many communities have set up commissions or bodies of trained chemists and engineers to take care of these problems, and where the individual communities have been careless of their neighbors it has been necessary to create state, national, and international boards to deal with them.

But these boards and commissions cannot work to best advantage without the support of public sentiment, and so today many civic organizations and public spirited agencies are taking an active part in the study of conditions; the consideration of methods, and the dissemination of knowledge and information, to arouse a public interest in the solving of one of the commanding issues of the present era, the problem of sewage disposal.

Sewage disposal as an engineering science has not suddenly come into perfect being. It has taken the results of many years' experience and the conscientious effort of many thoughtful people to bring it to its present state of perfection. Nor has it now stopped improving. The accepted standards of a few years ago are today condemned by our boards of health, and the plant of today must be built with all possible wisdom that it may continue to be a matter of pride to its creators throughout its useful life.

Nature of Sewage

CITY sewage in general includes the run-off from households, offices, and human habitations, usually termed domestic sewage, combined with more or less trade wastes and factory run-off, usually termed industrial sewage. The latter is not always the most dangerous from the point of view of disease but it is often the most difficult to handle in sewage treatment plants because of the irregularity of discharge and the possible high concentrations of suspended fiber, dye wastes, fats, soaps, food residues, acids, etc.

The strength or concentration of sewage may vary widely depending on such factors as the per capita consumption of water, the quantity of storm water such as roof and street drainage, and the nature and percentage of industrial run-off which the sewer is called upon to handle. In any case, however, sewage is essentially dirty water carrying floating matter, suspended solids, and dissolved impurities, all in a more or less active state of bacterial decomposition. A proper disposal system must therefore take account of all these.

Natural Disposal

THE earliest, cheapest, and best method of sewage disposal was by simple dilution, that is, collection through the city by trunk line sewers which were discharged into a stream of running water. Natural agencies then set to work to dispose of the organic matter by oxidation or reduction through the action of microorganisms. Running fresh water contains dissolved oxygen capable of supporting the life of fermentive organisms which may inoffensively convert the organic matter of the sewage to soluble or volatile inert forms. The mineral residue then drops out, leaving essentially pure water carrying practically nothing to indicate that it has ever been polluted, except a slight increase of salt content.

If insufficient oxygen is present, then instead of oxidation, putrefac-

tive organisms flourish which convert the organic matter to foul smelling gases and soluble compounds. Again the mineral matter drops out but this time it is fouled by putrefactive substances, while the water which runs off must be exposed over and over to the air until it has absorbed enough oxygen to oxidize completely the compounds which have been left behind after the putrefaction.

Simple dilution, therefore, is satisfactory only provided the water flow is thirty to sixty times the sewage flow, provided there is no adjacent community downstream, and provided the city has no other interest in its river except to use it as a sewer. These conditions will hold good so long as the city is small and remote, and the river large. But with the natural growth of time and particularly as the knowledge of water-borne diseases has increased, there are left few cities with this cheap opportunity. Fortunate indeed is the city which today has not had to make some major investment for additional treatment.

Sewage Treatment

SINCE sewage fundamentally consists of a liquid carrying solid matter with it, the basic principle of all sewage treatment consists first of separating these two and then disposing of each. In some systems of disposal the purification of the products starts during the separation, but for any complete process both the liquid and the solid receive further treatment.

The simplest disposal system, next to dilution only, is screening and dilution, a process for partial improvement. A properly installed fine screen will remove about one-half of the visible suspended solids so that the effluent looks much better. But it is still as heavily loaded with disease germs and still requires the same amount of dilution to keep it from becoming foul, and still produces sludge banks around the point of discharge. Furthermore, the screenings must be disposed of by incineration or otherwise, a costly operation at best. Screening plants are usually installed where the principal consideration is the appearance of the effluent.

Chlorination is often combined with screening. This is because screening plants produce offensive odors and chlorine helps to control them. Also, chlorine reduces the number of disease germs. But while it kills the bacteria which are feeding at the time on the organic matter in the sewage, it does not eliminate this matter. It merely delays its consumption so that after its discharge from the end of the outfall sewer it may build up in sludge banks and deposits which may again become the breeding place for countless organisms.

MODERN complete methods of sewage disposal must consider not only what may be screened out but the fifty per cent of suspended matter which may not be screened out, and more particularly the dissolved organic matter and the bacteria. These may be more or less completely removed by three principal methods: (1) Septic treatment; (2) Chemical precipitation; and (3) Biochemical reduction.

Septic treatment was the first of these complete methods to be widely used. It involves two reactions, putrefaction and oxidation, and consists in causing the sewage to putrefy in the absence of air, whereby organic matter is disintegrated and reduced in volume, being largely decomposed into gases (such as ammonia, marsh gas, and carbon dioxide) and a sludge-like residue which settles to the bottom. After this putrefactive separation, the sewage liquor must be oxidized in the presence of air to render it stable and to convert the ammonia into nitrites or nitrates.

The putrefactive separation requires tanks with a capacity for about six to eight hours' retention, and means for handling the putrefactive gases. The oxidation takes place quickly, but requires the sewage to be sprayed or otherwise exposed to the air in trickling filters, contact beds, or intermittent filters. The sludge is periodically withdrawn and is buried or spread on sludge-drying beds. Both of these reactions require much space and are likely to create offensive odors. They must be carried out at some remote spot where land is cheap and inhabitants are few, and serve well when these conditions can be met.

In activated sludge plants, the settling and oxidation of the liquors have been combined. The bacterial decomposition is promoted by inoculation with virile sludge from a previous cycle, while the oxidation is promoted by pumping air mechanically through the sewage during its six hours' retention. Either septic tanks or activated sludge plants produce a highly odoriferous sludge, which must be disposed of by burying, burning, or stabilizing.

THE stabilizing process consists of placing the sludge carrying perhaps 5% of solids in underground tanks, protected against access of air usually by tight-fitting covers. Under these conditions anaerobic putrefaction sets in, producing gases such as hydrogen and marsh gas, which may be collected in storage tanks for use as fuel in heating sludge beds.

The putrefactive reaction proceeds for ninety or a hundred days and is assisted in cold weather by the application of artificial heat. After the three months' putrefactive period, the sludge is withdrawn and spread

on drying beds, which are much in the nature of sand filters. Here the liquid drains away and the sludge dries. These drying beds are sometimes housed under glass, since the putrefactive odors may be very offensive. Activated sludge plants are preferred to septic plants for large cities with extensive suburban districts.

Chemical treatment has reduced the time required for separation of the solid matter in sewage from six or eight hours to two hours. It consists in adding to the sewage such chemicals as iron and alkali, which will thicken or coagulate and form a curd or floc. This floc gathers in or adsorbs the organic matter and quickly settles out. The last traces are then removed by filtering, leaving a clear, relatively pure effluent.

The sizes of tanks required for a chemical process are only a third as large as the equivalent septic tanks, but to offset this saving the cost of chemicals must be considered. Furthermore, the problem of sludge disposal still remains and in an exaggerated form because of the added bulk and weight of the chemicals. These usually amount to from fifteen to twenty per cent of the dry weight of the sludge which they bring down. They make burning more difficult and burying or stabilizing more costly. They contribute but little to the control of odors which are aggravated if the necessary mixing is accomplished by air jets. Chemical plants are satisfactory if the costs of sludge incineration can be afforded.

BIOCHEMICAL reduction, a recent development in sewage disposal, has lowered the cost of chemical treatment, has accomplished odor control and has provided a new method of sludge disposal. It combines the use of enzymes or biochemical substances for breaking up organic matter, with colloidal adsorbents or jelly-like substances for gathering in the organic matter, including odors, and settling it out. The enzymes and adsorbents consist of a portion of bio-loam, which is merely properly stabilized humus from a previous cycle, and this low cost substance takes the place of a part of the higher-priced chemicals.

The biochemical cycle starts immediately beyond the comminutor bar screens or other coarse screening device. Here the stabilized end product is added and mixed into the sewage for a period of fifteen or twenty minutes. The first effect of this agent is to absorb all odors and the next effect is to disintegrate and absorb organic matter.

The humus is rich in enzymes, which have been developed by the stabilizing process. These enzymes are fat-splitting, protein-splitting, and carbohydrate-splitting, and they begin to accomplish their action on the organic matter of the sewage much more quickly than would an

inoculation of living organisms. In addition the humus is splitting alkalines in reaction and tends to neutralize acidity which may be present in the sewage. Furthermore, it apparently has a favorable buffer action. These qualifications, together with its highly adsorbent nature and granular form, cause it quickly to settle out much of the suspended solids of the sewage in a form satisfactory for dewatering in a centrifuge.

The added bio-loam is allowed to settle for twenty minutes, iron salt is then added and mixed in for twenty minutes, after which the floc which has been formed is allowed to settle for an hour. The effluent from this process passes through a suitable filter and is ready for discharge into the river, with or without chlorination.

The sludge which has settled out during the two settling periods is passed through a centrifuge and is then ready for the stabilizer. In the stabilizer it is stored in a moderately ventilated condition for a period of five days. During this time it undergoes active oxidation, as the animal matter is rapidly converted to vegetable matter through the growth of actinomyces, producing carbon dioxide and heat which drives off most of the moisture. To break up any lumps which may have formed, it is then passed through a disintegrator and back to storage for another five days.

At the end of this period it will have completed its oxidation and vegetization and will have dried itself out to a stable, non-fermentable, non-putrescible loam containing about three per cent of nitrogen and smaller amounts of phosphate and potash. It has a mild odor like fresh garden loam and has a value sufficient to pay for the stabilizing process.

Bio-reduction is satisfactory wherever for economic reasons the plant must be situated in a valuable location, where space is limited, where odor must be controlled, and incineration or burial of sludges cannot be afforded. The determination as to which type of sewage disposal system is best suited to each community can be made only after a survey by a competent engineer. However, where space is at a premium, where odor must be controlled, where the sewage must be more than just screened, where sludge banks in the river cannot be tolerated, where a small, compact plant must suffice, and where operating costs must be reduced by the inherent values in the sewage itself, then a biochemical plant possesses qualifications which cannot be lightly overlooked and which will demand careful consideration on the part of those civic bodies whose members are responsible for the formation of enlightened public opinion.

INSTITUTE NOTES

OFFICERS

M. L. CROSSLEY, *President*
Calco Chemical Co.
Bound Brook, N. J.

HOWARD S. NEIMAN, *Secretary*
233 Broadway
New York, N. Y.

ARTHUR J. HILL, *Vice-President*

ALAN PORTER LEE, *Treasurer*

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Objectives of the American Institute of Chemists

1. To provide and enforce a code of principles of professional conduct which merits public esteem and justifies confidence in the integrity of the chemist;

2. To establish and maintain a standard of proficiency of such excellence as to insure competent and efficient service;

3. To secure an adequate basic training for the profession and admit to fellowship in the Institute only those of proved education, experience, competency, and character;

4. To strive to enhance the prestige and distinction of the profession and to extend its influence and usefulness;

5. To establish and maintain a register of membership in which there shall be a complete record of the training, experience, and fitness for service of each member;

6. To seek to improve the economic status of the profession by cooperating with employers to secure a satisfactory appreciation and evaluation of the services of the chemist;

7. To provide a means for the appropriate recognition of distinguished service to the profession;

8. To cooperate with all agencies serving chemistry to make the profession of chemistry a powerful factor in the advancement of intellectual and material progress in the United States of America, to the end that this nation shall assume its rightful place as a leader among the nations of the world in scientific thought and accomplishment;

9. To lend support to the work of the chemical societies in the education of the public to a better appreciation of the contribution of the chemist to world progress;

10. To render such other services to the profession as developments shall warrant and The American Institute of Chemists shall approve.

Qualifications for Membership

The membership of THE AMERICAN INSTITUTE OF CHEMISTS consists of Honorary Members, Fellows, Associates, Juniors, and Student Members.

Student Members are those who have attained the fourth year in chemistry or chemical engineering in an educational institution of recognized standing.

Juniors are those who have received the bachelor's degree, or its equivalent, on completion of four years in chemistry or chemical engineering in an educational institution of recognized standing.

Associates are those who have had a minimum of six years of collegiate and postgraduate work in chemistry or chemical engineering, at least two years of which training must be of an advanced nature, or who can demonstrate to the satisfaction of the Council that they have the equivalent of this educational training.

Fellows are those who have the qualifications of Associates and an additional five years of experience and responsibility in the practice of the profession, except that those who received their academic training prior to 1926 may substitute two years of professional experience for the two years of graduate study.

Our New Members

AUSTIN O. ALLEN, F.A.I.C., received the B.S. degree from St. Lawrence University. His experience has been largely in the manufacturing of insecticides and paints, and he holds several patents. He is general superintendent of A. C. Horn Company, Long Island City, N. Y.

FRANK J. ANDRESS, F.A.I.C., holds A.B., M.Sc., and Ph.D. degrees from the University of Cincinnati. Specializing in biochemistry, public health work, and clinical laboratory work, he has published several papers, and is the author of "A Laboratory Manual for Public Health Students." His position is: Professor of Biochemistry and Preventive Medicine at the Eclectic College of Medicine, Cincinnati, Ohio.

HOWARD LEONARD BENDER, F.A.I.C., obtained the degrees of A.B. and M.A. from Marietta College; a B.S. in Chemical Engineering from the Case School of Applied Science, and a Ph.D. from Columbia University. His specialty is synthetic resins, a subject to which he has contributed several publications and patents. He is employed as a research chemist with the Bakelite Corporation, Bloomfield, N. J.

ALVIN P. BLACK, F.A.I.C., won an A.B. (cum Laude) degree from Southwestern University, studied at Harvard, and holds a Ph.D. from the University of Iowa. Specializing in water and sewage treatment, he has published a number of research papers. He is national president of Gamma Sigma Epsilon, past-president of the Florida Section of the A. C. S., and a captain in the Chemical Warfare Service, Officers' Reserve. He is a professor of agricultural chemistry, University of Florida, Gainesville, Florida.

FRANK P. BROCK, F.A.I.C., obtained B.S. and M.S. degrees from the Univer-

sity of Kansas. In collaboration with L. V. Redman, F.A.I.C., and A. J. Weith, he has published several articles on phenolic resins and their plastics. He is employed by the Bakelite Corporation, Bloomfield, N. J., as a research engineer.

FRANK B. BURNS, A.A.I.C., has B.A. and M.S. degrees from Vanderbilt University. His specializations are: uniformity in synthetic resin manufacture and rheological properties of bituminous products. In collaboration with others, he has published several articles. He is a research chemist with the United States Gypsum Company, Chicago, Ill.

WILLIAM R. CATLOW, JR., F.A.I.C., studied at the University of Florida and Carnegie Institute of Technology; from the latter he holds the degree of B.S. in chemical engineering. For more than six years he has done active research in the development of new oil-soluble types of phenol-aldehyde resins. He is a research chemist with the Bakelite Corporation, Bloomfield, N. J.

LEO H. CROSSON, J.A.I.C., has a B.S. degree from Clemson College, and an M.S. from the University of South Carolina. He is employed as a chemist by the South Carolina Surface Waters Project, Clemson, S. C.

NEIL E. GORDON, F.A.I.C., a member of the Institute until 1934, was reinstated to Fellow membership. He was formerly editor of the *Journal of Chemical Education*, and is also a former member of the Institute's Committee on Professional Education. He holds Ph.B., A.M., Pd.B. degrees from Syracuse University, and a Ph.D. from The Johns Hopkins University, where he is now a professor of chemical education.

KIRK T. HOLLEY, F.A.I.C., was educated at Alabama Polytechnic Institute (B.S. degree), and the University of Missouri (B.S. degree). Specializing in agricultural chemistry, he has written a number of bulletins issued by his laboratory at Georgia Experiment Station, Experiment, Georgia, where he is employed as a chemist.

GEORGE JERZYKOWICZ, A.A.I.C., graduated from the University of Paris with a B.-es.L. degree, from the Federal Polytechnic School, Zürich, Switzerland, with the degree of Ing.-chem., and from American University, Washington, D. C. with a Ph.D. Specializing in organic and dye chemistry, he is doing research work for the Color and Farm Waste Division of the U. S. Department of Agriculture, Washington, D. C.

VIRGIL E. MEHARG, F.A.I.C., holds a B.S. degree from Rice Institute, has studied at the University of Minnesota, and has received an M.S. degree from Northwestern University. His specialty is phenol resin plastics and their raw materials, and in collaboration with others, he has written several articles, and taken out a number of patents in this field. He is a research chemist with the Bakelite Corporation, Bloomfield, N. J.

FRANCIS G. METRO, A.A.I.C., received a B.Sc. in chemistry from George Washington University, Washington, D. C. Chiefly interested in analytical chemistry, laboratory synthesis, organics, mineralogy, chemical apparatus engineering, he is a technical engineer (chemistry) with the Porter Chemical Company, Hagerstown, Maryland.

JACQUE C. MORRELL, F.A.I.C., obtained a B.S. degree from Cooper Union and M.A. and Ph.D. degrees from

Columbia University. He has specialized in the chemistry of hydrocarbons, petroleum technology, activated carbon, catalysis, and colloid chemistry, holding more than 100 patents in these fields, in addition to having had published alone or in collaboration with others over 100 articles which appeared in the technical journals. He is associate director of research of Universal Oil Products Company, Chicago, Ill.

CASH B. POLLARD, F.A.I.C., graduated from William Jewell College with an A.B.; from Purdue University with M.S. and Ph.D. degrees, and has studied at Wisconsin University. His preferred fields are organic chemistry research and research direction, and scientific criminal investigations. In collaboration, he has written about 20 articles appearing in technical journals. He holds the position of associate professor of chemistry at the University of Florida, Gainesville, Florida.

LUCY T. PORCELLI, J.A.I.C., holds a B.A. degree from Hunter College, and at present is a technician at Swedish Hospital, Brooklyn, N. Y.

MALCOLM F. PRATT, F.A.I.C., received B.S. and M.S. degrees from Tufts College, and a Ph.D. from Harvard. In collaboration with James B. Conant he has had several papers published on organic compounds. He is a paint technologist with Socony-Vacuum Oil Company, Brooklyn, N. Y.

HORACE E. RILEY, F.A.I.C., won a B.A. degree from Marietta College, where he also did graduate study. His specialty is analytical chemistry. His position: analyst, research chemist with the Bakelite Corporation, Bloomfield, N. J.

WILLIAM G. ROUGHEAD, S.A.I.C., is studying at Newark College of Engineering, and is also employed by the Bakelite Corporation, Bloomfield, N. J.

RALPH C. SHUEY, F.A.I.C., received a B.S. degree in chemical engineering from the University of Kansas, and has also studied at the University of Birmingham, England. Alone or in collaboration with others, he has published a number of articles mainly in the resin and varnish fields. He is employed as a research chemist by the Bakelite Corporation, Bloomfield, N. J.

NORMAN A. SKOW, F.A.I.C., has B.S., M.S., and Ch.E. degrees from the State University of Iowa, and a Ph.D. degree from Cornell. Specializing in filtration, extraction of rare metals, plastics, he has published in collaboration several articles, and has several patent applications. He is a research chemist with the Bakelite Corporation, Bloomfield, N. J.

ROBERT C. SWAIN, F.A.I.C., obtained an A.B. degree from Stanford University, studied at Heidelberg University, Germany, and received a Ph.D. from the University of Berlin, Germany. His preferred fields are physical and colloid chemistry, and synthetic resins, and he has published a number of articles in America, Germany, and England. His position is: research chemist with American Cyanamid Company, Tremley Laboratory, Linden, N. J.

VICTOR H. TURKINGTON, F.A.I.C., received his education at the University of Kansas. Specializing in phenol-aldehyde resins, plastics, and varnishes, he holds about 20 patents and, in collaboration, has published a number of technical articles. He is employed as a research

chemist by the Bakelite Corporation, Bloomfield, N. J.

HAROLD F. WAKEFIELD, F.A.I.C., has an A.B. degree from Southwestern College, and an M.S. from the University of Wisconsin. Specializing in colloid chemistry and rheological properties of the phenol resins, he holds several patents and in collaboration has published a number of articles. He is a research chemist with the Bakelite Corporation, Bloomfield, N. J.

ARCHIE J. WEITH, F.A.I.C., holds a B.S. in chemical engineering from the University of Kansas, and an M.S. in chemistry from the same university. He has many patents on phenolic condensation products both in America and abroad, and is associate director of research of the Bakelite Corporation, Bloomfield, N. J.

L. R. WHITING, F.A.I.C., has studied at Austin College, Fairmount College, and graduated from Kansas University, where he has also done graduate work. Specializing in resins, he has applied for several patents, and is employed as a chemist by the Bakelite Corporation, Bloomfield, N. J.

Applications for Membership

FELLOWS

AUBISON T. BURTSELL, *Teacher*, College of the City of New York, New York, N. Y.

AUTHUR M. BUSWELL, *Professor of Chemistry*, University of Illinois, Urbana, Ill.

WILLIAM H. BUTLER, *Research Chemist*, Bakelite Corporation, Bloomfield, N. J.

VERNON K. KRIEBLE, *Professor of Chemistry*, Trinity College, Hartford, Conn.

TOWNES R. LEIGH, *Head Department of Chemistry*, University of Florida, Gainesville, Fla.

V. N. MORRIS, *Research Chemist*, Resinous Products and Chemical Co., Philadelphia, Penna.

RAOUL J. STONER, *Assistant Chemist*, Municipal Building, New York, N. Y.

WILBUR O. TEETERS, *General Manager*, Hoke, Inc., 122 Fifth Avenue, New York, N. Y.

RALPH C. WILBUR, *Refinery Chemist*, Shell Petroleum Corporation, Wood River, Ill.

ASSOCIATES

RAYMOND C. BACON, *Research Chemist*, Calco Chemical Co., Bound Brook, N. J.

WALTER W. DURANT, *Chemist*, American Cyanamid Co., Linden, N. J.

DONALD L. FULLER, *Research Chemist*, American Cyanamid Co., Linden, N. J.

MARTIN E. HULTQUIST, *Research Chemist*, Calco Chemical Co., Bound Brook, N. J.

MORRIS MARGOLIS, *Junior Chemist*, Municipal Building, New York, N. Y.

LEONARD P. MOORE, *Research Chemist*, American Cyanamid Co., Linden, N. J.

JOHN S. ODELL, *Chemist*, N. Y. State Racing Commission Laboratory, 157 Chambers Street, New York, N. Y.

RICHARD O. ROBLIN, JR., *Research Chemist*, American Cyanamid Company, Linden, N. J.

Available

Counsel for chemical industrial problems available. Fellow of THE AMERICAN INSTITUTE OF CHEMISTS. Graduated from University of Pittsburgh. Ph.D., Heidelberg, Germany. Studied Royal Polytechnic Institute. Experience: Chief chemist, consulting organic chemist, member research staffs, with leading firms. Write THE CHEMIST, Box 1135, 233 Broadway, New York, N. Y.

The Chemist Abroad

"What the Chemist Abroad Is Doing," by R. H. Kienle, F.A.I.C., was received too late for publication in this issue of THE CHEMIST. It will be a feature of the December number. Dr. Kienle recently returned from Europe and reports interesting new developments in the field of science.

To Appear

Articles on the following subjects are scheduled for publication in early issues of THE CHEMIST: "Gas—Latest Concept of Warfare," "Personality and the Laboratory," "Air Conditioning."

Editorial

(*Continued from page 328*)

in an attempt to increase the public respect for those who follow the profession; should face his personal responsibility in furthering the interests of his fellow chemists and of his profession, and this can be accomplished only by an intense, earnest, and active cooperation among those chemists who believe that they are professionals and not tradesmen.

The chemists are solely responsible for the present deplorable condition of their profession and they only can demand the respect of the public which is rightly theirs.

Don't be a lonely, solitary Casabianca chemist.

Professional suggestion: Send a subscription for THE CHEMIST to a chemist who is not a member of the Institute and acquaint him with the work being done in his professional field. **Please turn to page 357.**

BOOKS

Back Numbers of The Chemist

A few copies of the following issues of THE CHEMIST are now available. Two or three articles chosen at random from each issue are listed to assist those interested in particular subjects to obtain a valuable reference. These few remaining copies of THE CHEMIST may be obtained for 15 cents each as long as they last. Remittance in stamps or coins should be sent to THE CHEMIST, 233 Broadway, New York, N. Y.

June, 1932

Medal Award to Charles H. Herty—Special articles by J. H. Finley, F. E. Breithut, Joseph E. Ransdell, *et al.*
Chemistry and United Fruit — By Hartley Rowe

July, 1932

Chemistry in Carpets — By G. E. Hopkins
The Non-ferrous Field — By H. F. Bradley
The Emulsifiable Oil Industry — By Lloyd W. Davis

October, 1932

Censoring Foods and Drugs — By P. B. Dunbar
A Chemist Looks at Alcohol Control — By C. A. Nowak
Prospects in Paper — By R. H. Stevens

November, 1932

Chemical Warfare Superstitions — By J. Mitchell Fain
Chemistry at Vassar — By Mary Landon Sague
Should Chemists Be Licensed — By E. Gudeman

December, 1932

Should Chemists Be Licensed—A Symposium by Leading Chemists
Research on Farm Crops — By H. G. Knight
The Purchasing Chemist — By A. X. Schmidt

January, 1933

When Prosperity Returns — By W. J. Baëza
Biography of W. Friedrich Ostwald — By A. P. Sachs

No New Thing By LaWall and Harrisson

February, 1933

Professional Directory—A Symposium
Science in Retail Merchandising By E. H. Harvey
Need for Licensing By Frederick Kenney

March, 1933

Future of Chemical Employment By D. H. Killeffer
Chemist and Industry—A Symposium
Supply House Research By R. T. Major

April, 1933

Vitamin Research and Public Health By T. H. Zucker
Experiment *vs.* Experience By C. D. Ingersoll
Chemicalization of Industry By Williams Haynes

September, 1933

An Educational Opportunity By W. T. Read
Chemist to Aid of Consumer By R. C. Erb
Possibilities in Fermentation Work By C. A. Nowak

November, 1933

Specialization By Max Trumper
Petroleum Research By W. B. Ross
Colloid Chemist By Raymond Szymanowitz

December, 1933

Codes and the Employee Chemist By B. Janer
Contracts—A Symposium
Pharmaceutical Research By A. Richard Bliss

January, 1934

Economic Emancipation of the Chemist By M. L. Crossley
Education of a Chemist By C. D. Ingersoll

February, 1934

Man of Science and Economic Change By T. W. Davis
Chemist in Advertising By F. H. Bivins

NEWS

The American Institute of the City of New York announces the following programs: *November 26*, 8:00 P. M. Round Table, Metal Products Auditorium, International Building, Rockefeller Center, New York: Motion Pictures in the Research Laboratory. Mr. E. S. Lincoln, Consulting Engineer. Dr. Henry Roger, Rolab Photo-Science Laboratories. *December 3*, 8:00 P. M. Institute Meeting Room, New York. "Casting the 200-Inch Glass Reflecting Mirror for the World's Largest Telescope." Mr. Leon V. Quigley, F.A.I.C., Public Relations Counsel. Mr. A. E. Marshall, Consulting Chemical Engineer. *December 10*, 8:00 P. M. Round Table. Institute Meeting Room, New York. "Some Interesting Uses of Aerial Surveys." Col. Harold E. Hartney, Technical Adviser, Subcommittee on Aircraft Investigation. Mr. William H. Meyer, Jr., General Manager, Fairchild Aerial Surveys, Inc. *December 13*, 8:00 P. M. General meeting. Metal Products Auditorium, Rockefeller Center, New York. "Steel Alloys." Mr. Frederick B. Hufnagel, President, Crucible Steel Company of America. Dr. John Johnston, Director of Research, U. S. Steel Corporation. Mr. H. W. McQuaid, Republic Steel Corporation. *December 17*, 8:00 P. M. Round Table. Institute Meeting Room, New York. "The Imperative Need for Insect Control and Its Importance to the Individual." Mr. H. B. McClure, F.A.I.C., Carbide and Carbon Chemicals Corporation. Mr. E. P. Collins, Carbide and Carbon Chemicals Corporation.

Dr. A. Richard Bliss, Jr., F.A.I.C., Dean of the School of Pharmacy of Howard College of Birmingham, Alabama, represented Columbia University, of which he is an alumnus, at the inauguration of Dr. Alfred Benjamin Butts as Chancellor of the University of Mississippi on October 19th.

Edward L. Gordy, A.A.I.C., was married on October 12, 1935, to Miss Alice McIlvaine of Fayetteville, Pennsylvania. Mr. and Mrs. Gordy will make their home at New Philadelphia, Ohio, where Mr. Gordy is employed as chief chemist of the W. C. Hardesty Company, manufacturers of stearic acid. Mr. Gordy was editor of THE CHEMIST from 1931 to 1934.

Foster Dee Snell, F.A.I.C., addressed the Lehigh Valley Section of the American Chemical Society on October 18th. In Dr. Snell's talk on "The Consulting Chemist, Who, What and Why?" he pointed out that broadly interpreted there are about 20,000 consulting chemists in the United States.

LEON V. QUIGLEY, F.A.I.C., was married September 12, 1935, to Miss Marian Sherin, New York teacher. Mr. Quigley is a public relations counsel with offices at 730 Fifth Avenue, New York.

CARL ZEISS, INC., makers of cameras and optical instruments, are publishing in New York a new monthly magazine devoted to photography. Its subscription price is $1.50 a year. The address: Carl Zeiss, Inc., 485 Fifth Avenue, New York, N. Y.

Teachers of science in high schools near Cincinnati have been invited to attend a series of free lectures under the auspices of the University of Cincinnati. In addition to this series for teachers, the University is continuing its free lectures to advanced students in near-by high schools, who stand at the top of their classes in chemistry, physics, or advanced mathematics. The lecture series is in charge of Dr. S. B. Arenson, Associate Professor of Chemistry.

Professor Edwin G. Conklin, Department of Biology, Princeton University, lectured to the New York University Chapter of Sigma Xi on November 13th. His subject was "Scientific and Social Progress."

A meeting of the Société de Chimie Industrielle was held November 14, 1935, at Columbia University, New York, N. Y. Professor Colin G. Fink addressed the meeting on, "High Speed Rotary Cathode."

The New York and North Jersey Sections of the American Chemical Societies will hold a joint meeting on December 6th, in the new Hayden Planatarium building of the American Museum of Natural History, New York, N. Y. Among the features of the meeting will be an address by Professor Donald H. Menzel, Professor of Astro-Chemistry, Harvard University.

A meeting of the North Jersey Section of the American Chemical Society was held at the Winfield Scott Hotel, Elizabeth, N. J., on November 11th. Miss Wanda K. Farr, Associate Cotton Technologist, Department of Agriculture, spoke on "Cellulose Membranes." Group Meetings were held after the lecture. M. L. Crossley, President, A.I.C., was in charge of the Organic Group which led by George L. Royer, A.A.I.C., discussed "Micro Organic Analysis." The Physical and Inorganic Group was in charge of Dr. R. C. Gerke, represented by Dr. C. P. Roe.

The 1935 award for chemical engineering achievement will be presented by *Chemical and Metallurgical Engineering* to E. I. duPont de Nemours and Company at the conclusion of the Fifteenth National Exposition of Chemical Industries, to be held in New York, December 2nd to 7th.

SOME RECENT PUBLICATIONS BY MEMBERS

Metals and Alloys, October, 1935:

THOMAS A. WRIGHT; "Progress in Spectrographic Analysis."

U. S. Department of Agriculture, Technical Bulletin No. 485, September, 1935:

A. L. MEHRING, W. H. ROSS (with L. M. WHITE and J. E. ADAMS); "Effects of Particle Size on the Properties and Efficiency of Fertilizers."

A symposium on "Women's Place in Chemistry," will be held at the Exposition of Chemical Industries in Grand Central Palace on Saturday, December 7th, at 2:15 P. M. sharp.

Attendance is limited to senior and graduate students and members of the Faculty in the Departments of Chemistry at the women's colleges or co-educational institutions within the metropolitan area.

Dr. W. T. Read, F.A.I.C., Dean of the School of Chemistry, Rutgers University, and Chairman of the Educational Division of the Exposition, will preside.

Florence E. Wall, F.A.I.C., consulting chemist, author and lecturer, well

(Please turn to page 354)

The Walrus and the Carpenter

IT IS disturbing to detect in these days of increasing nationalisms a spreading tendency on the part of governments to include in their programs for national solidarity, the regimentation of science.

Nations possessing scientific scholars have in the past made some use of their talents in time of war. Profiting from this experience as to the value of science in time of war, nations have made increasing use of science in coping with the various disruptions which follow cessation of armed conflict. Accordingly, there exists in such major countries as England, Italy, Soviet Russia, Germany, and now the United States, science advisory boards which act in advisory capacity on scientistic questions of interest to these governments.

Since the scientific interests of various nations differ according to their resources and needs, it can reasonably be expected that research projects likewise differ. It was, however, not expected that nations would differ in the philosophy of scientific research. Since nations do differ in the philosophy of government, scientists must discard the once respected axiom that science knows no national boundaries.

Scientific research in U. S. S. R. has by edict been primarily and chiefly directed to the interests of the State. Very little, if any, of Russian scientific work finds publication in world literature. Even more distressing is the evidence of curtailed independent scientific research in Germany. Similar though less drastic conditions likewise exist in Italy. Scientific research of interest to the "National Socialistic State" or by whatever name the State chooses to call itself is the increasing order of the day. With eminent scholars devoting less and less time to independent scientific research, and equally famous scholars banished, and famous institutions like the Physical Chemical Institute of Haber abolished, independent scientific research formerly so deservingly famous in Germany, is seriously threatened.

Independent scientific research is often costly and most wasteful. Yet if scientific research must all be of the applied variety, what are we to do when there no longer is pure research to apply? Simple answer is to purposely cause research to go off in tangents, these tangents furnishing potential sources for pure research. Which type of research is the most costly and wasteful?—*The Chemist-Analyst.*

L. W. B. Please note:

A Texas dairy expert says flavoring water with whisky will cause a cow to drink more and therefore give more milk.—*The Pathfinder.*

Prehistoric Chemists

The most ancient of chemical products is lampblack. Twenty-five thousand years ago some inspired paleolithic man decorated the ceiling of his cave in northern Spain with pictures of bison, deer, and boars. The outlines of his creations remain, and analysis proves that the pigment of his crude paint was lampblack. The black outlines of this troglodyte's animals constitute the earliest known records of the use of lampblack. Similar evidence found in different parts of the world proves that knowledge of the manufacture of lampblack was ancient and widespread.—*Monsanto Current Events.*

Early Patents

It is interesting to note that the first United States Patent, granted on July 31, 1790, to Samuel Hopkins, was a chemical one for a "Process of manufacture of potash and pearlash," also that German Patent No. 1, granted in 1878 to J. Zeltner was chemical, covering the production of ultramarine violet by treating ultramarine blue or ultramarine green with chlorine.—D. D. B.

News

(*Continued from page 352*)

known for her active interest in professional education and vocational guidance, will be chairman of this special program. It is planned to cover teaching and hospital work; scientific and technical advertising, editorial work, and publicity; and several of the newer fields—textiles, cosmetics, gemmology, public health, etc.—in which women trained in chemistry have shown particular aptitude and found success.

Among the speakers will be: Miss Patricia Edgerly, Director of the New York Medical Exchange; Dr. Ralph L. Evans, Technical Director, Sales Affiliates, New York; Miss Calm M. Hoke, F.A.I.C., Consulting Chemist, Jewelers' Technical Advice; Mr. L. W. Hutchins, Vice-President, Morse, Sheldon, Hutchins, and Easton; Dr. M. Helene Lewinsohn, Department of Chemistry, Jamaica High School; Mr. Charles W. Mulford, Director, Schermerhorn Teachers' Agency; Mrs. Margaret Hayden Rorke, Director, The Textile Color Card Association of the United States.

Dr. M. Helene Lewinsohn, long associated with Adelphi College, is Chairman of the Committee on Arrangements for the afternoon. She will be assisted by Mrs. Sells, of Teachers' College, Columbia, and representatives of many other colleges within the metropolitan area.

Development of an improved colorimetric method for determining minute quantities of lead in fruit, foodstuffs, and liquids was reported November 11th, at the annual meeting of the Association of Official Agricultural Chemists at Washington, D. C. The new method matches colors with instruments instead of by eye. The sensitive chemical reagent, dithizone, and the photometer which measures the color of a given liquid, are used.

E. R. Weidlein, F.A.I.C.

On the evening of November 9th the Chemical Industry Medal of the American Section of the Society of Chemical Industry was awarded in Rumford Hall of The Chemists' Club, New York, at a joint meeting of the Section and the New York Section of the American Chemical Society.

The meeting was in charge of Robert J. Moore, *Chairman*, and Foster Dee Snell, *Secretary*. The life and professional activities of the medalist were described by L. V. Redman. The presentation of the medal was made by D. D. Jackson.

The recipient of the medal, Edward R. Weidlein, delivered an extensive address, describing the work at the Mellon Institute for Industrial Research under its founder, the late Robert Kennedy Duncan, his successor, R. F. Bacon, and the present Director of the Institute, the medalist himself. Be it noted that the five men, mentioned above, who participated in the meeting, are all Fellows of The American Institute of Chemists.

The U. S. Institute for Textile Research, Inc., held an annual meeting at the Waldorf-Astoria Hotel, New York, N. Y., on November 14th. Several papers describing the actual application in textile mills of new research results were read. Dr. Robert Andrews Millikan, physicist of California Institute of Technology, was the guest speaker.

Mr. H. H. Clegg, Assistant Director, Federal Bureau of Investigation, United States Department of Justice, lectured on "Science in Crime Detection" to the American Institute at its meeting on November 19th in New York. Professional fact: All of the scientists except two employed in the laboratory of the Bureau of Investigation are trained lawyers. Question from audience during discussion: Are the bulbs and ridges on the tips of fingers vestigial remnants of scales?

J. W. H. Randall, F.A.I.C., will speak on "Some Chemical Aspects of the Laminated Glass Industry," at a meeting of the New York Chapter of the Institute to be held Dec. 13th.

Correction

FREDERIC H. ADAMS, recently raised from the rank of Associate to that of Fellow, was incorrectly listed in the October number of THE CHEMIST as a "Research Assistant" at Calco Chemical Company. Mr. Adams holds the position of "Research Chemist" at Calco.

Civil Service Examinations

The United States Civil Service Commission, Washington, D. C., announces the following open competitive examinations for positions of: Associate Metallurgist (Recovery), $3,200.00 a year. Associate Metallurgist (Physical), $3,200.00 a year. Assistant Metallurgist (Recovery) $2,600.00 a year. Assistant Metallurgist (Physical), $2,600.00 a year. File applications with the Commission not later than December 9, 1935. College degree and at least two years of experience are required. Application forms may be obtained from the *Secretary, Board of U. S. Civil Service Examiners*, at any first-class post office, from the Civil Service Commission at Washington, D. C., or from the U. S. Civil Service district office in cities having such district office.

Visit the American Institute of Chemists' booth at the coming Chemical Exposition. See page 336.

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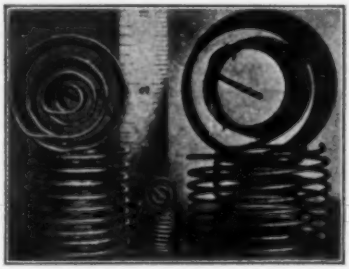

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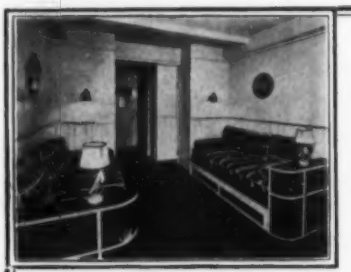

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